

What is claimed is:

1. A method for determining a mass airflow in an air duct,  
5 comprising:

providing a mass airflow sensor to capture signals, each  
of which corresponds to an amount of a value of the mass air-  
flow, such that sensor signals are captured and values are  
determined for the mass airflow using a characteristic curve;

10 subjecting a time series of signals, which comprises  
several signals which have been captured, to a vibration  
analysis, which determines a fundamental vibration and at  
least one prescribed harmonic vibration of the fundamental  
vibration and compares parameters of the fundamental vibra-  
15 tion and the prescribed harmonic vibration; and

establishing a backflow against the average mass air-  
flow, due to pulsations, when the ratio of the parameters of  
the harmonic vibration to the fundamental vibration exceeds a  
prescribed threshold value.

20 2. The method in accordance with claim 1, wherein the am-  
plitude and/or phase angle is used as the parameter.

25 3. The method in accordance with claim 1, wherein the value  
of the mass airflow corresponding to a most recent captured  
signal is corrected for occurrence of backflows in the air  
duct when it has been established that a backflow exists.

30 4. The method in accordance with claim 1, further compris-  
ing determining a value for the level of modulation of the  
pulsation from the ratio of the parameters for the fundamen-  
tal vibration and the harmonic vibration, and the value is  
used for correction.

35 5. The method in accordance with claim 1, wherein the vi-  
bration analysis is carried out at prescribed time intervals

which are larger than the time intervals between the capture of successive sensor signal values.

6. The method in accordance with claim 5, wherein the correction of values for the mass airflow is made on based on one of the last vibration analyses.

7. The method in accordance with claim 1, further comprising providing an intake air duct of an internal combustion engine as the air duct, such that at least one operating parameter of the internal combustion engine is captured, and the vibration analysis is performed when the operating parameter which is captured lies within a prescribed range, in which pulsations of a prescribed minimum strength are expected.

8. The method in accordance with claim 1, wherein the values for a mass airflow variable are determined from the signals by using the characteristic curve for the mass airflow sensor, and the vibration analysis is performed based on a time series of mass airflow variable values which corresponds to the time series of the signals.

9. The method in accordance with claim 1, wherein the vibration analysis is carried out using a Fourier analysis.

10. The method in accordance with claim 1, wherein the parameters of the fundamental vibration and the harmonic vibration are determined using a power spectrum.

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11. The method in accordance with claim 1, further comprising providing an intake air duct of an internal combustion engine as an air duct, such that a rotation speed is determined for the internal combustion engine, and in determining the fundamental vibration, the rotation speed of the internal combustion engine is used.

12. The method in accordance with claim 11, wherein the harmonic vibration used is the first harmonic vibration.

13. The method in accordance with claim 1, wherein the parameter for at least one additional harmonic vibration is determined, and in addition the ratio of the parameters for the fundamental vibration to the additional harmonic vibration and/or the ratio of the parameters for the harmonic vibration to the additional harmonic vibration is used in establishing a backflow and/or for correction purposes.

14. A mass airflow sensor unit, comprising:

a mass airflow sensor, with which a signal is formed corresponding to a magnitude for a mass airflow in an air duct; and  
an analysis device, linked to the mass airflow sensor, converts the signals from the mass airflow sensor into values for the mass airflow.

15. The mass airflow sensor unit in accordance with claim 14, wherein the mass airflow sensor unit captures signals, each of which corresponds to an amount of a value of the mass airflow, such that sensor signals are captured and values are determined for the mass airflow using a characteristic curve;

subjecting a time series of signals, which comprises several signals which have been captured, to a vibration analysis, which determines a fundamental vibration and at least one prescribed harmonic vibration of the fundamental vibration and compares parameters of the fundamental vibration and the prescribed harmonic vibration; and

establishing a backflow against the average mass airflow, due to pulsations, when the ratio of the parameters of the harmonic vibration to the fundamental vibration exceeds a prescribed threshold value.